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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/676,011	09/29/2000	Ron P. Maurer	1006310-1	9252

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HEWLETT PACKARD COMPANY
P O BOX 272400, 3404 E. HARMONY ROAD
INTELLECTUAL PROPERTY ADMINISTRATION
FORT COLLINS, CO 80527-2400

EXAMINER	
EDWARDS, PATRICK L	
ART UNIT	**PAPER NUMBER**
2621	

DATE MAILED: 08/28/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/676,011	MAURER, RON P.	
	Examiner	Art Unit	
	Patrick L Edwards	2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-29 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1,2,8-11,17,18,23,24 and 29 is/are rejected.

7)☒ Claim(s) 3-7,12-16,19-22 and 25-28 is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities: unclear language in the final paragraph of page 4 of the specification. The paragraph states that "constant R is a single global parameter that controls corresponds to the dynamic scale for sharpening". This sentence is unclear and grammatically incorrect.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 23 and 29 are rejected under 35 U.S.C. 102(a) as being anticipated by Bamberger (US Patent 5,970,164). With regard to claim 1, Bamberger discloses a method for processing pixel intensity values of a digital image. Clipping pixel values outside of a variable range is analogous to Bamberger's process of discarding pixel values outside a stretching interval (Bamberger column 7 lines 60-62). The process of mapping the pixel values that fall within the variable range is shown in Figure 3A and the analogous process of enhancing pixel contrast in a region of interest is mentioned in Bamberger column 7 lines 57-59. It should be noted that the "stretching interval" from the figure corresponds to the "variable range" as

mentioned in claim 1. Figure 3A shows that pixel intensities are "mapped" inside the stretching interval and "clipped" outside of the stretching interval. With respect to claim 23, Bamberger discloses an apparatus for performing sharpening techniques on a digital image. Said apparatus comprising a processor for determining a contrast range (see step 210 in Figure 2 of Bamberger in connection with column 6 lines 60-63). The "contrast range" mentioned in claim 23 corresponds to Bamberger's brightness levels (Bamberger column 6 lines 60-63). Furthermore, Barmberger's mention of enhancing the contrast of a digital image (Barmberger column 7 lines 42-44) is analogous to digital image sharpening. As to claim 29, Bamberger further discloses a microcomputer (Bamberger component 12 Figure 1). Said microcomputer is coupled to memory (Barmberger components 16 and 18 in Figure 1), which is used for storing information. Although Bamberger does not explicitly disclose that the image sharpening program is to be stored in said memory, the concept of storing computer programs in memory is inherent to microcomputers and we can therefore assume the image sharpening program to be stored in said coupled memory of said microcomputer.

4. Claims 10 and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Shin (US Patent 5,524,070). With respect to claim 10, Shin discloses a method for sharpening a digital image comprised of a plurality of pixels (Shin column 4 lines 17-30). Said method determines the dynamic range for a 9x9 pixel neighborhood (see Figure 5A in connection with column 4 lines 17-22) by calculating the averaging intensity and the standard deviation of the pixel neighborhood and determining stretch and offset values (Shin column 4 lines 27-29). Contrast stretching is then performed according to the stretch and offset values. This process is then performed on a pixel-by-pixel basis (see Figure 4 step 44 in connection with column 6 lines 39-41). With regard to claim 17, Shin also discloses an apparatus (see Figure 1), comprised of a

processor (see Figure 1 image processing system 20), for determining the dynamic range of a pixel neighborhood and performing contrast stretching according to said dynamic rage.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 2 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bamberger in view of Shin. The arguments in Paragraph 3 above as to the applicability of Bamberger are incorporated herein. Bamberger does not explicitly disclose that the variable range "is a function of dynamic range of a local pixel neighborhood." Note that Bamberger does obtain a dynamic range based on maximum and minimum levels as seen in step 210 of Figure 2, but it is not clear that a local neighborhood is being used. On the other hand, Shin calculates dynamic range based on a local pixel neighborhood (the 9x9 neighborhood shown in Figure 5A of Shin). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a local neighborhood as taught by Shin in Bamberger's system so that any small variations in contrast occurring locally could be compensated for.

7. Claims 11 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shin in view of Bamberger. The arguments stated above in Paragraph 4 as to the applicability of Shin are incorporated herein. Shin fails to disclose a contrast stretching method where pixel

intensity values are either clipped or mapped depending on whether they lie inside or outside a contrast range that is a function of the dynamic range. Shin discloses a method for contrast stretching, but it involves calculating pixel intensity averages and standard deviations. Bamberger, however, explicitly discloses a method wherein pixel values are mapped if inside a dynamic range or stretching interval and clipped otherwise. It would have been obvious to one reasonably skilled in the art to use Bamberger's mapping and clipping method of contrast enhancement in conjunction with Shin's method of determining dynamic range within a local pixel neighborhood in order to eliminate the lengthy calculation of average intensity and standard deviation of a pixel neighborhood inherent in Shin's method. These lengthy calculations are replaced by a much simpler determination of max and min values within a neighborhood and subsequent linear mapping. Such a modification would have allowed for a contrast stretching algorithm that required fewer processor calculations and memory fetches and resulted in faster algorithmic performance.

8. Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shin in combination with Bamberger and further in view of of Kuo (US Patent 5,982,926). Kuo discloses enhancement techniques for color images. It would have been obvious to one reasonably skilled in the art to modify the combination of Shin and Bamberger to include Kuo's disclosure of image enhancement techniques for color images in order to perform contrast stretching on color images as well as gray scale images.

Allowable Subject Matter

9. Claims 3-7, 12-16, 19-22 and 25-28 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patrick L Edwards whose telephone number is (703) 305-6301. The examiner can normally be reached on Monday – Friday between 8:30 and 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo Boudreau can be reached on (703) 305-4706. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

PE
Patrick L Edwards
08/21/2003

LEO BOUDREAU
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600